

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Michael S. Beck, et al.

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For: System and Method for Actively
Controlling Traction in an Articulated
Vehicle

Group Art Unit: 3616

Examiner: Eric D. Culbreth

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SUPPLEMENTAL REPLY BRIEF

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SUPPLEMENTAL REPLY BRIEF

Applicants hereby submit this “Supplemental Reply Brief” to the Board of Patent Appeals and Interferences (“the Board”) in response to the “Supplemental Examiner’s Answer” dated June 17, 2010. It is believed that no fee is due; however, should any fees under 37 C.F.R. §§ 1.16 to 1.21 be required for any reason, the Commissioner is authorized to deduct said fees from Williams, Morgan & Amerson, P.C. Deposit Account No. 50-0786/2063.007600.

I. POSTURE OF THE CASE

Once all the briefing on the appeal was completed and jurisdiction transferred to the Board, the Board issued an order remanding the case to the Examiner for consideration of a new ground of rejection. The Examiner then filed a “Supplemental Examiner’s Answer” containing the new ground of rejection. Applicants were given the choice of either reopening prosecution on the merits or maintaining the appeal. (“Supplemental Examiner’s Answer”, p. 15) Applicants choose to maintain the appeal and therefore file this “Supplemental Reply Brief”. 37 C.F.R. §41.50(a)(2)(ii)

II. NEW STATUS OF THE CLAIMS

Since the “Supplemental Examiner’s Answer” instituted a new ground of rejection, Applicants restate the status of the claims—*i.e.*, the new status of the claims. Claims 1-23 and 44-63 are pending in the case. Claims 1-23 were originally filed in the case, claims 24-43 were previously cancelled, and claims 44-63 were previously added. Claims 24-43 were canceled responsive to a restriction requirement. The Office rejected each of claims 1-23 and 44-63 as follows:

- claims 44-46 as indefinite under 35 U.S.C. §112, ¶2, for allegedly inadequate supporting disclosure for a means plus function limitation;
- claims 1-5, 7-11, 13-15, 17-22, 44-48, 50-54, 56-58, and 60-63 were rejected as obvious under 35 U.S.C. §103(a) over United States Letters Patent 5,517,414 (“Hrovat”) in view of United States Letters Patent 4,895,257 (“Brandstadter”);

- claims 6, 12, 16, 49, 55, and 59 were rejected as obvious under 35 U.S.C. §103(a) over Hrovat in view of Brandstadter and United States Letters Patent 6,481,801 (“Krueger”); and
- claim 23 was rejected as obvious under 35 U.S.C. §103(a) over Hrovat in view of Brandstadter and United States Letters Patent 5,762,407 (“Stacey et al.”).

Applicants appeal from each and every rejection of each and every claim. For the convenience of the Office, Applicants expressly identifies the claims involved in this appeal as claims 1-23 and 44-63.

III. SUBSTANTIVE ISSUES

A. CLAIMS 44-46 ARE DEFINITE

1. The Board Should Decide This Issue Even Though It is Improperly Presented

Applicants respectfully submit that the issue of whether claims 44-46 are definite has been brought into play improperly, but that the Board should nevertheless decide the issue. The rejection was first made in the “Supplemental Examiner’s Answer” during this appeal. It is well established that the Examiner cannot present new grounds of rejection during appeal, 37 C.F.R. §§41.69(b), 41.43(a)(2), and can only be introduced by reopening prosecution, 37 C.F.R. §41.69(d). However, it is equally well established that the Board *can* make a new ground of rejection on appeal, 37 C.F.R. §41.50(b), or order additional briefing on such an issue, 37 C.F.R. §41.50(d).

Applicants brief the definiteness of claims 44-46 below since it has been raised in this appeal by order of the Board even if the rejection itself was improperly imposed. Both Applicants and the Examiner have now briefed the issues. Applicants therefore respectfully submit considerations of economy and efficiency suggest that the Board consider the issue briefed pursuant to 37 C.F.R. §41.50(d) and decide the issue under 37 C.F.R. §41.50(b).

2. The Claims are Definite

The Examiner rejected claims 44-46 because the “comparing means” limitation is allegedly insufficiently described. (“Supplemental Examiner’s Answer”, pp. 4-5) The complaint, more particularly, is that the detailed description is only of a general purpose computer without supporting description of algorithm. (*Id.*, p. 5). Applicants respectfully submit that the Office (1) misconstrues the disclosure with respect to the “general purpose computer” and (2) has overlooked or failed to appreciate portions of the specification that more than adequately support the limitation.

The actual limitation from claim 44 in question is:

means for comparing the performance characteristic of the wheeled vehicle and the performance characteristic of the at least one of the plurality of wheel assemblies

Applicants agree that this is a “means-plus-function” limitation. Such limitations are “construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.” 35 U.S.C. §112, ¶6. This clearly implies that the specification need not disclose every embodiment.

The rejection is predicated on a line of legal authority in which the courts have held that where a means is disclosed as a “general purpose computer”, the underlying processing technique must be disclosed. (*see* “Supplemental Examiner’s Answer”, p. 4) The specification and drawings disclose not a “general purpose computer”, but rather a “controller”. (“controller” 1602, FIG. 16; ¶[0134]-¶[0139] as published) A “controller” is defined by its function—*i.e.*, that it “controls” something—and that definition turns on the context in which it is employed. Thus, no “controller” is a “general purpose computer” because a general purpose computer necessarily must operate across a variety of contexts. That is what makes it general purpose. It is true that a “controller” may be implemented using a “general purpose” microprocessor or other computing device. However, by the time that “general purpose” device is programmed for the context in which it will perform as a “controller”, it is no longer “general purpose.” Thus, the “controller” of the present invention cannot be construed to be a “general purpose computer” since the term “controller” indicates that it has already been tailored for its intended context.

But, more importantly, the specification contains all the disclosure that it needs for the processing technique. The specification opens by stating that there is no single implementation and implying that the means will be implementation specific depending on the environment:

As the vehicle 100 travels, it is likely to encounter various types of terrain. For example, the terrain may be relatively homogeneous and soft, such as loose gravel or sand, or may be relatively homogeneous and hard, such as a paved surface. Alternatively, the terrain may be heterogeneous, such that it comprises both hard and soft materials. Further, for example, heterogeneous terrain may include firmly fixed rocks with loose sand, gravel, mud, or rocks disposed therebetween. Heterogeneous terrain may also include variations in terrain elevation. For example, when traversing a depression or ditch, one or more of the tires 410 may not be in contact with the terrain, resulting in a loss of traction for the one or more tires 410. *Various embodiments of the method for controlling traction presented above may be used to address different terrain scenarios. Each of the exemplary scenarios will be discussed in turn.*

(¶[0117] as published, emphasis added) The specification then goes on to, in fact, provide those exemplary scenarios.

The Office particularly points to the embodiment illustrated in FIG. 14, which is the one in which the vehicle is traversing homogeneous, hard terrain. The technique is described in the specification at ¶[0125]-¶[0128]. In particular, the specification expressly states:

FIG. 14 shows an illustrative embodiment of a method for controlling traction in an articulated vehicle on homogeneous, hard terrain. The velocity of the vehicle 100 is determined (block 1402) and stored (block 1404). The rotational velocity for each of *the tires 410 is determined (block 1406) and stored (block 1408). The stored velocities are then analyzed (block 1410), which may include, for example, converting raw sensor data into meaningful representations of the vehicle 100 velocity and/or the velocities of the tires 410. However, the stored, raw data may be analyzed without such a conversion. In either case, a determination is made whether the velocity of each of the tires 410 corresponds to the vehicle 100 velocity, i.e., whether the tire velocities are within an expected range based on the vehicle 100's velocity* (block 1412).

(¶[0127] as published, emphasis added) Thus, contrary to the Office's allegation, Applicants disclose how the velocities are analyzed and compared—*i.e.*, with or without conversion of the raw data to wheel velocity and whether such is within an expected range based on the vehicle's velocity.

But the specification also has this level of disclosure for the other two embodiments. The embodiment for homogeneous, soft terrain is illustrated in FIG. 12 and FIG. 13, and operates on traction or wheel loading as disclosed in ¶[0118]. The specification further states:

Thus, FIG. 13 depicts an illustrative embodiment of the present method of controlling the traction of an articulated vehicle on generally soft terrain. In the illustrated embodiment, load data from the sensors (e.g., load sensors, torque sensors, pressure sensors, or the like, as discussed above) is acquired (block 1302) and stored (block 1304). *The stored data is analyzed (block 1306), which may include, for example, converting raw sensor data into meaningful representations of loads in the wheel assemblies 102. However, the stored, raw data may be analyzed without such a conversion. In either case, a determination is made whether the loads are level (block 1308). If the loads are level, the process is restarted. If, however, the loads are not level, the lightly loaded wheel assembly 102 is identified (block 1310) and it is articulated toward the terrain (block 1312).* Control is returned to block 1302 and the process is restarted.

(¶[0121] as published, emphasis added) And, for operations in heterogeneous terrain, the technique is disclosed in FIG. 15, relative to which the specification states:

FIG. 15 shows an illustrative embodiment of a method for controlling traction in an articulated vehicle on heterogeneous terrain. The velocity of the vehicle 100 is determined (block 1502) and stored (block 1504). *The rotational velocity for each of the tires 410 is determined (block 1506) and stored (block 1508). The stored velocities are then analyzed (block 1510), which may include, for example, converting raw sensor data into meaningful representations of the vehicle 100 velocity and/or the velocities of the tires 410. However, the stored, raw data may be analyzed without such a conversion. In either case, a determination is made whether the velocity of each of the tires 410 corresponds to the vehicle 100 velocity, i.e., whether the tire velocities are within an expected range based on the vehicle 100's velocity (block 1512)*

(¶[0130] as published, emphasis added) Additional supporting disclosure on this embodiment is found in ¶[0131]-¶[0132].

Applicants have therefore not only provided sufficient disclosure to support the limitation, they have done so three times over. As eminently disclosed, in each circumstance, the performance characteristic of the vehicle and the wheel assembly are sensed by an appropriate sensor. The sensed data may be converted, but is not required to be. The sensed data is then

compared either directly or using ranges derived from the sensed characteristic depending on the characteristic involved. With respect to the particular embodiment to which the Office points, the requisite disclosure is found in ¶[0127] as published.

The question ultimately is whether those skilled in the art can ascertain the scope of the claim. The standard applied here is naught but a particular application in the context of a means-plus-function limitation. As the Office has already acknowledged:

Definiteness of claim language must be analyzed, not in a vacuum, but in light of:

- (A) The content of the particular application disclosure;
- (B) The teachings of the prior art; and
- (C) The claim interpretation that would be given by one possessing the ordinary level of skill in the pertinent art at the time the invention was made.

M.P.E.P. §2173.02. Applicants respectfully submit that claims 44-46 are definite in light of the accompanying disclosure, knowledge in the art, and as construed by one in the art.

B. ALL CLAIMS ARE UNOBVIOUS OVER THE ART OF RECORD

The “Supplemental Examiner’s Answer” repeats the same arguments with respect to the obviousness rejections as did the originally filed answer. Applicants therefore set forth once again their reply. In particular, the rejections err because:

- Hrovat teaches an on-road suspension while Brandstadter teaches an off-road suspension;
- the on-road/off-road distinction is controlling because it means Hrovat and Brandstadter cannot be combined;
- the Office misconstrues Applicants’ position on combination;
- the Office misconstrues Applicants’ position on teaching away; and
- Brandstadter teaches away from Hrovat

Each of these will now be addressed in turn.

1. Hrovat Teaches an On-Road Suspension, Brandstadter Teaches an Off-Road Suspension

The Office alleges some confusion in Applicants' briefing over whether Hrovat and Brandstadter teach on-road or off-road suspensions:

The appellant argues on pages 12-13 of the Appeal Brief that Brandstadter teaches away from using an on-road active suspension in off-road vehicles (actually, the appellant's remarks are confusing, stating in the lower half of page 12 that Hrovat is an on-road vehicle and that Brandstadter is for an off-road vehicle, but then stating in the first full paragraph of page 13 that Hrovat is an off-road vehicle).

(Examiner's Answer, p. 10) Applicants disagree, but rather than quibble over whether there is some sort of confusion, hereby clarifies the record. Hrovat teaches an on-road suspension system. Brandstadter teaches an off-road suspension system.

2. The On-Road/Off-Road Distinction is Controlling Because it Means Hrovat and Brandstadter Cannot be Combined

The Office believes that the on-road/off-road distinction is not probative:

At any rate, this [distinction] is not persuasive because a combination of teachings is not a bodily incorporation of parts (i.e., the features of Brandstadter in the combination would be adapted for the intended use or terrain to be encountered), because the terms "on-road" and "off-road" in themselves do not patentably distinguish features (i.e., off-road vehicles such as Brandstadter's tank frequently travel on the road, and cars such as Hrovat's frequently travel off the road at beaches, events where one parks on the grass, hiking in wilderness, etc.), and because in the combination of teachings Hrovat's vehicle in fact could be/would be converted to encounter off-road terrain (note Brandstadter, column 1, lines 15-20 where off-road systems use passive suspension systems; column 1, lines 38-41 where active systems are used for road vehicles; and column 3, lines 26-35 where the object of Brandstadter's invention is to use an active system on an off-road vehicle; in the combination Hrovat would be improved for off-road conditions). Contrary to applicant's on page 13, Brandstadter does not "teach away" from using on-road active suspension systems in off-road vehicles such as Hrovat, but rather teaches improving an off-road suspension system by making it an active suspension system, in which case Hrovat's suspension system would be improved for off-road conditions.

(Examiner's Answer, p. 10) So, per the Office, the distinction is irrelevant because tanks sometimes travel on roads and cars sometimes travel off roads. This is akin to saying there is no real difference between the avionics of the SR-71 and the Space Shuttle because the SR-71

can travel outside the Earth's atmosphere and the Space Shuttle travels through the atmosphere on launch and re-entry.

Such an argument is just wrong on its face. Even people illiterate in the art understand that while tanks *can* travel on roads, they are designed to travel *off* roads and that off-road is a very different thing from on-road. People illiterate in the art also understand that while one *can* drive a car off road, it is not designed for that—which is why many cars that actually do travel on beaches need to be towed out of them. The root question is not the kind of environment in which the suspension can be used, but rather for what kind of environment it is designed.

But the bigger reason the argument is wrong is because the evidence of record contradicts it. Brandstadter affirmatively states that on-road suspension systems are not suitable for off-road applications. Applicants again quote the relevant passage from Brandstadter:

In a road vehicle, the dynamic component is primarily due to the acceleration, braking, and cornering inertial forces acting on the vehicle. These forces are smaller than the static force, and the aforescribed parallel arrangement results in a substantial reduction in the energy required to stabilize the vehicle in reaction to these forces.

In an off-road vehicle, however, the dynamic component is primarily due to terrain disturbances producing large road wheel motions. The forces associated with these large motions are greater than the static force and the parallel arrangement results in an increase in the energy required to isolate the vehicle in reaction to these motions. *Thus, the increased size, weight, and cost of the parallel arrangement is not offset by a comparable reduction in the energy requirements under off-road conditions and, therefore, this type of system is not applicable to off-road vehicles generally and to combat vehicles specifically.*

(col. 2, lines 6-24; emphasis added)

There is no evidence of record that contravenes this teaching in Brandstadter. As is reestablished below, through this passage, Brandstadter teaches away from Hrovat and from Hrovat's application against Applicants' claims. Thus, under applicable law and policy, Hrovat and Brandstadter cannot properly be combined on the *evidence* of record. *In re Fine*, 5 U.S.P.Q.2d (BNA) 1596, 1599 (Fed. Cir. 1988); *In re Gordon*, 221 U.S.P.Q. (BNA) 1125, 1127 (Fed. Cir. 1984); M.P.E.P. §2145 X D 2.

3. The Office Misconstrues Applicants' Position on Combination

The Office misconstrues Applicants' position with respect to the improper combinability of Hrovat and Brandstadter:

At any rate, this [distinction] is not persuasive *because a combination of teachings is not a bodily incorporation of parts* (i.e., the features of Brandstadter in the combination would be adapted for the intended use or terrain to be encountered), because the terms "on-road" and "off-road" in themselves do not patentably distinguish features...

(Examiner's Answer, p. 10) Applicants' position in no way suggests or asserts that Hrovat and Brandstadter are improperly combined because there can be no "bodily incorporation of parts". Indeed, whether there can be "bodily incorporation of parts" is irrelevant to the decision. Applicants' position is that they are not properly combinable because of their respective teachings. More particularly, because Brandstadter teaches away from Hrovat.

4. The Office Misconstrues Applicants' Position on Teaching Away

The Office misconstrues Applicants' position on Brandstadter teaching away from Hrovat. The Office alleges:

On pages 14-15 of the Appeal Brief, the Appellant argues that Brandstadter, column 3, lines 5-25 teaches away from using any on-road active suspension systems off-road (actually, this is reversed; what the Appellant seems to be arguing is that Brandstadter's off-road system cannot be used on an on-road vehicle like Hrovat).

(Examiner's Answer, p. 11) Once again, rather than quibble over what was said in the "Appeal Brief" or even what Applicants' "seemed to be arguing", Applicants clarify exactly what it is they are arguing—Brandstadter teaches away from using on-road suspension systems such as those taught by Hrovat.

5. Brandstadter Teaches Away from Hrovat

The Office disputes Applicants' arguments that Brandstadter teaches away from using on-road suspension systems off-road. The Office first states:

Contrary to applicant's on page 13, Brandstadter does not "teach away" from using on-road active suspension systems in off-road vehicles such as Hrovat, but rather teaches improving an off-road suspension system by making it an active suspension system, in

which case Hrovat's suspension system would be improved for off-road conditions.

(Examiner's Answer, p. 11) This argument immediately raises the question of why one would need to improve Hrovat's suspension system (or any on-road suspension system) for off road conditions if it were already suitable. The Office subsequently states its position more fully:

On pages 14-15 of the Appeal Brief, the Appellant argues that Brandstadter, column 3, lines 5-25 teaches away from using any on-road active suspension systems off-road (actually, this is reversed; what the Appellant seems to be arguing is that Brandstadter's off-road system cannot be used on an on-road vehicle like Hrovat). However, this is not persuasive because of Brandstadter, column 3, lines 26-35 cited above, where he teaches adapting an active suspension for off-road use is the very object of his invention. Brandstadter's disclosure of using active suspensions, previously used with on-road suspensions, on an off-road suspension at column 3, lines 26-35 and column 1, lines 38-41 above hence provide support for the examiner's statements cited on page 15 of the Appeal Brief (that the skilled artisan would understand the conditions for which a suspension arrangement is suitable and hence design the suspension for the conditions to be encountered, and that the mechanics of on-road and off-road vehicles are often the same but adapted for particular conditions).

(Examiner's Answer, p. 11)

As a preliminary matter, the Office still has not dealt adequately with Brandstadter's express teaching the on-road suspension systems are unsuitable for off-road vehicles:

In a road vehicle, the dynamic component is primarily due to the acceleration, braking, and cornering inertial forces acting on the vehicle. These forces are smaller than the static force, and the aforescribed parallel arrangement results in a substantial reduction in the energy required to stabilize the vehicle in reaction to these forces.

*In an off-road vehicle, however, the dynamic component is primarily due to terrain disturbances producing large road wheel motions. The forces associated with these large motions are greater than the static force and the parallel arrangement results in an increase in the energy required to isolate the vehicle in reaction to these motions. Thus, the increased size, weight, and cost of the parallel arrangement is not offset by a comparable reduction in the energy requirements under off-road conditions and, **therefore, this type of system is not applicable to off-road vehicles generally and to combat vehicles specifically.***

(col. 2, lines 6-24; emphasis added) The Office anchors its position on col. 3, lines 26-35 and col. 1, lines 38-41, neither of which do anything to rebut Applicants' construction. The first passage only states an objective of the invention regarding the particular off-road suspension system it is disclosing:

Another feature of the present invention *is to provide an active hydropneumatic suspension system **for off-road vehicles***, wherein a sprung mass is supported relative to a movable unsprung mass and wherein the system's energy requirements are reduced, and in particular, wherein the sprung mass is the hull of a heavy combat vehicles, supported by such an active hydropneumatic system whose energy requirement is substantially less than the energy absorbed by the dampers of known passive suspension systems.

(col. 3, lines 26-35, emphasis added) Not only is this passage expressly limited to an off-road suspension system, there is no evidence of record that “active hydropneumatic suspension systems” are necessarily “on-road” suspension systems. The second passage avails the Office no better:

Numerous concepts for semi-active and active suspension systems whose object is to improve the ride and the stability of road and rail vehicles have been disclosed in United States Patents.

(col. 1, lines 38-41) This statement is so general it has no impact on the current question.

Thus, regardless of whatever arguments the Office may gin up over the disclosure of Brandstadter, the *evidence* of record regarding his disclosure is that Brandstadter:

- (1) expressly states that on-road suspension systems are unsuitable for use in off-road vehicles;
- (2) seeks to disclose “an active hydropneumatic suspension system for off-road vehicles”; and
- (3) asserts that a lot of semi-active and active suspension systems have been proposed for road and rail vehicles.

The sum of these three statements, though, is that Brandstadter teaches that on-road suspension systems are unsuitable for off-road vehicles. Brandstadter therefore teaches away from Hrovat.

IV. CONCLUSION

With respect to the definiteness rejection of claims 44-46,

With respect to the obviousness rejections of the subject claims, the Office continues to frame the issue of whether Brandstadter and Hrovat can be combined in terms of whether the two references both disclose an active suspension system. In the course of doing so, the Office tries to read out of, or at least minimize, the passage in Brandstadter that prohibits exactly the kind of combination the Office seeks to make. Whatever else the Office may say, argue, or reason, the following facts remain:

- (1) Hrovat teaches a system of a kind that Brandstadter describes as an “on-road” suspension system;
- (2) Brandstadter teaches an off-road suspension system; and
- (3) Brandstadter affirmatively states that on-road suspension systems are not suitable for off-road vehicles.

Regardless of whether the suspension systems of Hrovat and Brandstadter are both active systems, those facts remain.

Accordingly, under applicable law and policy, Hrovat and Brandstadter cannot properly be combined on the *evidence* of record. *In re Fine*, 5 U.S.P.Q.2d (BNA) 1596, 1599 (Fed. Cir. 1988); *In re Gordon*, 221 U.S.P.Q. (BNA) 1125, 1127 (Fed. Cir. 1984); M.P.E.P. §2145 X D 2. And, since each of the rejections relies on the combination of Brandstadter and Hrovat, they all fail. Applicants therefore pray that all rejections be REVERSED and the claims allowed to issue.

The Examiner is invited to contact the undersigned attorney at (713) 934-4053 with any questions, comments or suggestions relating to the referenced patent application.

Respectfully submitted,

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